

## REMARKS/ARGUMENTS

Claims 1-34 were pending in the current application. Applicants have amended claims 1, 6, 8, 9, 12, 16, 19, 20, 22-24, 27-31, 33, and 34. Reexamination and reconsideration of all pending claims are respectfully requested.

### **35 U.S.C. § 112**

The Office Action rejected claims 23, 29, and 33 under 35 U.S.C. § 112, second paragraph, as being vague and indefinite for failing to particularly point out and distinctly claim the subject matter based on the term “detecting for errors” and “setting LLRs for code bits of data symbol estimates detected to be in error to erasures for decoding”. The Office Action further rejects claims 24, 30, and 34 under 35 U.S.C. § 112, second paragraph, based on the definiteness of the term “detecting for errors.”

Applicants employed the phrase “detecting for errors” in the context “detecting for errors in the data symbols estimates based on the remodulated symbols” in claims 23, 24, 29, 30, 33 and 34. This is supported in the Specification at, for example, page 17, para. [0069], where this “detecting for errors” is described at length in the specification:

Applicants do not understand how the phrase “detecting for errors” as used in these claims can be considered vague or indefinite. As reflected in the present Specification and as understood by those skilled in the art, a stream of data may encounter error detection, wherein errors in the data stream are assessed. Applicants submit that the phrases that had been employed in the aforementioned claims were clear and definite. However, in an effort to move prosecution forward, Applicants have amended claims 23, 24, 29, 30, 33, and 34 to recite “further comprising performing an error detection function for the data symbol estimates...” (claim 23) or “a symbol error detector configured to perform an error detection function for the data symbol estimates” (claim 29), or similar language. Applicants contend that these terms are sufficiently clear and definite. Should the Examiner be of the opinion that these phrases are somehow indefinite or otherwise not allowable under 35 U.S.C. 112, Applicants request a more complete discussion of reasons for such alleged deficiency. The present Office Action merely includes conclusory statements such as “As to claims 23, 29, and 33, limitation ‘detecting for errors’ is vague and indefinite.” Office Action, p. 2. Applicants request a more detailed statement about any alleged deficiencies in the present claims if further 112 rejections are believed warranted.

Accordingly, it is respectfully submitted that all pending claims, as amended, fully comply with 35 U.S.C. § 112.

### **35 U.S.C. § 102**

The Office Action rejected claims 20-22, 25, 27, 28, 31, and 32 under 35 U.S.C. 102(a) as being anticipated by Bjerke et al., U.S. Patent Publication 2003/0103584.

#### *Previous Indication of Allowability*

Applicants initially object to the rejection of claims 22, 28, and 32 based on Bjerke. These claims had previously been indicated as allowable in the Office Action dated April 16, 2007 “if rewritten in independent form including all the limitations of the base claim and any intervening claims.” April 16, 2007 Office Action, p. 10, paragraph entitled “Allowable Subject Matter.” Applicants rewrote claims 22, 28, and 32 in independent form, and note that Bjerke was cited in the Office Action.

Applicants strongly object to the clear indication of patentable subject matter based on a reference and the subsequent rescission of the indication of allowance based on the very same reference. Such indications of allowance and subsequent rescissions harm Applicants, waste time and resources, and are contrary to the patent process.

Under the principles of compact prosecution, an Office Action on the merits should ordinarily identify every issue that stands between the applicant and allowance of the application. See, MPEP §707.07(g). The Office Action should do so by presenting the best case against patentability. See, e.g., MPEP §§2164.04 and 2106 (II.). This provides the Applicant with the opportunity to respond to each issue so that, if each issue is successfully rebutted or otherwise addressed, the application is in condition for allowance. A failure to provide the best case such that a new rejection, new art, and/or expanded arguments are required in a subsequent Office Action generally precludes the finality of that subsequent Office Action. See MPEP §706.07(a). This prevents piecemeal prosecution of the application, which the MPEP instructs should be avoided. MPEP §707.07(g) (“Piecemeal examination should be avoided as much as possible. The examiner ordinarily should reject each claim on all valid grounds available...”); MPEP §2164.04 (“The principles of compact prosecution also dictate that if an enablement rejection is appropriate and the examiner recognizes limitations that would render the claims enabled, the examiner should note such limitations to applicant as early in the prosecution as possible. In other words, the examiner

should always look for enabled, allowable subject matter and communicate to applicant what that subject matter is at the earliest point possible in the prosecution of the application.”)

Here, rejection of claims 22, 28, and 32 constitute piecemeal prosecution of the application, and Applicants request allowance of these claims at an early date, or at the very least, any subsequent Office Action regarding any of the present claims be non-final.

*Bjerke*

Applicants contend that the claims as previously provided are allowable over the references cited, and that the indication of allowability of claims 22, 28, and 32 was correct. Applicants have elected to amended independent claims 20, 22, 27, 28, and 31 to clarify specific aspects of the invention.

Regarding Bjerke, Applicants direct attention to FIG. 4C thereof, cited in the Office Action, which shows a “daisy chain” computation of LLRs. Data is received from demodulator 156, provided to interference nuller 450a, LLR computer 452a and decoder 440a, and the result is provided to interference canceler 460a. Output from interference canceler 460a is not fed back to LLR computer 452a, but instead is provided to another set of interference nuller, LLR computer, and decoder 450b, 452b, and 440b, respectively. Output from each of the t decoders shown is provided to P/S converter 442. A design such as the Bjerke design, as discussed in the specification, can require a significant amount of buffer capacity.

Contrast the Bjerke FIG. 4C drawing with FIGs. 4, 5, or 6 of the present application, which show varying embodiments wherein decoded base data streams are produced, and the decoded base data stream is fed back through an encoder/modulator, such as encoder/modulator 184 to an interference estimator (430) and summed with base stream LLR values to form enhanced LLR values. These enhanced LLR values, as shown in, for example, FIG. 4, are then provided to a multiplexer such as MUX 422, and the result is a combined decoded base stream and a decoded enhancement stream. *See, e.g.* paragraph [0026] of the Specification.

The purpose of this feedback design, as stated in the Specification, is to minimize buffering requirements. *See, e.g.*, Specification, paragraphs [0006] and [0007].

Claims 20, 22, 27, 28, and 31 of the present application have been amended to recite, among other limitations, “computing a decoded stream based on at least one of the received symbols and the LLRs for the code bits of the first data stream using a set of modules; ...

wherein the second data stream is provided to the modules to produce an enhanced decoded data stream.” (claim 20), “wherein the second data stream is based on the data symbol estimates and the second data stream is provided with the first data stream to produce an enhanced decoded data stream” (claim 22), and “wherein information from the LLR deriving means for code bits of the first data stream is combined with information from the LLR deriving means for code bits of the second data stream to form enhanced data symbol estimates” (claim 31), with similar limitations in the other independent claims rejected based on Bjerke.

Applicant submits that Bjerke’s design does not satisfy these limitations. The Bjerke design does not show a computing a decoded stream using a set of modules and providing the second data stream to the modules to produce an enhanced data stream. The Bjerke design does not feed the second data stream back through the same modules the first data stream is fed through. Also, Bjerke’s “daisy chain” design providing a second data stream with the first data stream to produce an enhanced decoded data stream. No combining of the first and second data stream is provided by Bjerke. Similar limitations are presented in all amended independent claims rejected based on Bjerke.

With respect to claim 32, Applicants dispute that Bjerke anticipates the claim. The limitations of “means for decoding the LLRs for the code bits of the first data stream to obtain decoded data for the first data stream”, “means for re-encoding and remodulating the decoded data to obtain remodulated symbols for the first data stream”, and “means for adjusting the LLRs for the code bits of the second data stream based on the remodulated symbols and the data symbol estimates for the first data stream” are not shown in Bjerke. As an example, the Bjerke design does not show adjusting the LLRs for the code bits of the second data stream based on the remodulated symbols and the data symbol estimates for the first data stream. While the Office Action cites FIG. 4c in rejecting this limitation, FIG. 4C of Bjerke shows no such design. The Office Action points to encoder 180 and modulator 182 in rejecting the “re-encoding and remodulating” aspects wherein remodulated symbols are formed, FIG. 4C does not receive output from encoder 180 or modulator 182, and thus cannot adjust LLRs based on remodulated symbols and data symbol estimates for the first stream.

Thus Applicants submit that claims 20, 22, 27, 28, 31, and 32 are not anticipated by Bjerke, and claims depending from these allowable claims are also allowable as they include limitations not shown by the cited reference.

**35 U.S.C. § 103**

The Office Action rejected claims 1-3, 5-9, 11-13, and 15-18, including independent claims 1, 12, and 16, under 35 U.S.C. 103 based on Bjerke in view of Sindhushayana, U.S. Patent 7,173,974. (“Sindhushanaya”). Claims 4, 14, and 19 were rejected under 35 U.S.C. §103 based on Bjerke in view of Sindhushayana and in further view of Maru, while claim 26 was rejected under 35 U.S.C. §103 based on Bjerke in view of Maru. Claim 10 was rejected under 35 U.S.C. §103 based on Bjerke in view of Leung.

Applicants have amended claims 1, 12, and 16 to recite, for example, “computing a decoded base stream based on derived LLRs”, “estimating interference based on the decoded base stream”, and “enhancing the decoded base stream by subtracting the estimated interference from the LLRs for the code bits of the first data stream to form a second data stream configured to augment the LLRs for the code bits of the first data stream and augment the decoded base stream” (claim 1). Claim 12, as amended, recites “modules configured to compute a decoded base stream based on derived LLRs received from the first computation unit; ... wherein the second data stream is combined with the first data stream and provided to the modules to enhance the decoded data stream to form an enhanced decoded data stream.” As noted above, Bjerke does not include these limitations. Bjerke does not provide the first stream of data and the second stream of data to modules as claimed, nor augment the LLRs for the code bits of the first data stream and augment the decoded base stream, and therefore is missing limitations from independent claims 1, 12, and 16, as amended.

Sindhushayana is relied on in the Office Action “for deriving LLRs for code bits of a second data stream by subtracting the estimated interference for the code bits of the first data stream.” Office Action, p. 5. This does not address the absence of the amended limitations from Bjerke, and Sindhushayana also does not provide the first stream of data and the second stream of data to modules as claimed, nor augment the LLRs for the code bits of the first data stream and augment the decoded base stream. Thus the present claims, as amended, are not obvious in view of Bjerke and Sindhushayana, alone or in combination. Claims depending from allowable base claims are also allowable as they include limitations not shown by the cited references, alone or in combination.

*Combination of References*

Further, Applicants submit that the combination of Bjerke and Sindhushayana, and/or any of the other cited references, is nothing more than a hindsight reconstruction of the invention, using Applicant's claims as a guide, which is improper.

The Patent Office must show that some reason to combine the elements with some rational underpinning that would lead an individual of ordinary skill in the art to combine the relevant teachings of the references. *KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. \_\_\_\_ (2007); *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Therefore, a combination of relevant teachings alone is insufficient grounds to establish obviousness, absent some reason for one of ordinary skill in the art to do so. *Fine* at 1075. In this case, the Examiner has not pointed to any cogent, supportable reason that would lead an artisan of ordinary skill in the art to come up with the claimed invention.

None of the references, alone or in combination, teaches the unique features called for in the claims. It is impermissible hindsight reasoning to pick a feature here and there from among the references to construct a hypothetical combination which obviates the claims.

It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps.  
[citation omitted]

*In re Gordon*, 18 USPQ.2d 1885, 1888 (Fed. Cir. 1991).

A large number of devices may exist in the prior art where, if the prior art be disregarded as to its content, purpose, mode of operation and general context, the several elements claimed by the applicant, if taken individually, may be disclosed. However, the important thing to recognize is that the reason for combining these elements in any way to meet Appellants' claims only becomes obvious, if at all, when considered from hindsight in the light of the application disclosure. The Federal Circuit has stressed that the "decisionmaker must step backward in time and into the shoes worn by a person having ordinary skill in the art when the invention was unknown and just before it was made." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566 (Fed. Cir. 1987). To do otherwise would be to apply hindsight reconstruction, which has been strongly discouraged by the Federal Circuit. *Id.* at 1568.

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

*W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983). Therefore, without some reason in the references to combine the cited prior art teachings, with some rational underpinnings for such a reason, the Examiner's conclusory statements in support of the alleged combination fail to establish a prima facie case for obviousness. *See, KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. \_\_\_\_ (2007) (obviousness determination requires looking at "whether there was an apparent reason to combine the known elements in the fashion claimed...", *citing In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness," KSR at 14).

Simply stating that the invention would have been obvious to a person of ordinary skill is also insufficient, for the assertion must be supported by clear and convincing evidence. *Panduit, supra*, 810 F.2d at 1568. The Office Action merely states that the invention would be obvious in light of the proposed combination, and did not provide clear and convincing evidence or reasoning to support this assertion.

The Examiner has failed to avoid the effects of hindsight reasoning in fashioning the combination of Bjerke and/or Sindhushayana and the other cited references, presents no reasons having rational underpinnings in support of the combination, and for these further reasons claims 1, 12, and 16, as amended, are allowable. Claims depending from claims 1, 12, and 16 are allowable as they include limitations not shown in the cited references, either alone or in combination.

Based on the foregoing, Applicants respectfully submit that claims 1, 12, and 16 are allowable over the references of record, and that all claims dependent from these amended independent claims are allowable as they depend from an allowable base claim.

Accordingly, it is respectfully submitted that all pending claims fully comply with 35 U.S.C. § 103.

### CONCLUSION

In view of the foregoing, it is respectfully submitted that all claims of the present application are in condition for allowance. Reexamination and reconsideration of all of the claims are respectfully requested and allowance of all the claims at an early date is solicited.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicants believe that no fees are due in accordance with this Response beyond those included herewith. Should any fees be due, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account No. 17-0026.

Respectfully submitted,

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